

# Resources to give facts a fighting chance against misinformation

Bärbel Winkler and John Cook  
EGU24 – EOS1.8 – Tuesday April 16, 2024



Thanks for the opportunity to tell you a bit about our debunking and prebunking resources we provide at Skeptical Science. My name is Bärbel Winkler and I've been involved with Skeptical Science since 2010. My presentation leverages material created by John Cook, founder of Skeptical Science and cognitive scientist working at the University of Melbourne.

# Why resources to fight misinformation are needed



We are being bombarded with a massive wave of misinformation about climate change in an effort to counter the facts about human-caused climate change. Vested interests, political polarization, the global nature of climate change, and misinformation add up to a perfect psychological storm, preventing people from accepting the reality of climate change. And, this is why we need resources to fight misinformation!

# Skeptical Science

<https://skepticalscience.com>



For detailed information about Skeptical Science please check the display presented at EGU2020

<https://sks.to/egu2020-display>

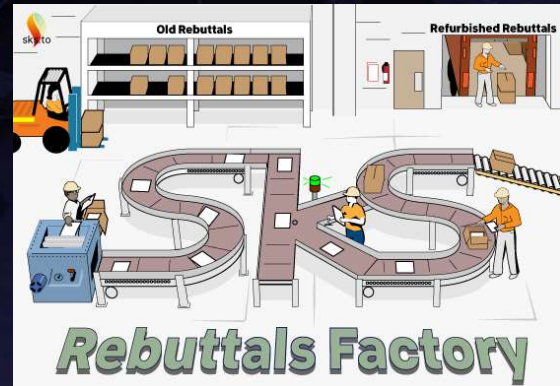
Skeptical Science (SkS) is a website and registered non-profit science education organization with international reach founded by John Cook in 2007. Our main purpose is to debunk misconceptions and misinformation about human-caused climate change and we have a database that currently has more than 200 rebuttals based on peer-reviewed literature.

We employ what science tells us about how people listen and think to deliver more effective communications, which is better than guessing. We encourage all science communicators to do this. What follows are a few examples of how we apply this.

For detailed information about Skeptical Science please check the display presented at EGU2020 <https://sks.to/egu2020-display>

# Skeptical Science – Rebuttal Updates

<https://sks.to/at-a-glance>



For detailed information about our rebuttal updates please check the display presented at EGU2023

<https://sks.to/egu23-abstract-1>



Since February 2023 we have been updating our rebuttals to common climate myths. They now feature an easy to understand “At a Glance” section in the basic level explanation followed by more details. Thus far, more than 60 of our more than 200 rebuttals have been updated and more are in the pipeline in our “rebuttals update factory”.

For detailed information about our rebuttal updates please check the display presented at EGU2023 <https://sks.to/egu23-abstract-1>

# Skeptical Science – Rapid Debunking

<https://sks.to/hotmess>

„Climate – the Movie: a hot mess with (c)old myths!“ – 25 of them to be exact!



Climate - the Movie: Skeptical Science Myth Rebuttals Online a hot mess of (c)old myths!

Use "http://sks.to/" plus the keyword listed in the table to access the complete rebuttal on SkepticalScience.com

#11	#21	#31	#41	#51	#61	#71	#81	#91	#101
see	past	consensus	cooling	moon	temp	1998	1200	iceage	antarctica
#12	#22	#32	#42	#52	#62	#72	#82	#92	#102
lag	lungacts	gene	cosmic	coll	hurricane	1994	hockey	news	ab
#13	#23	#33	#43	#53	#63	#73	#83	#93	#103
1500type	ectoparasit	sealevel	vapor	planets	green	oceanheat	climategate	o2	smoothly
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greenhouse	%	nuclecentury	glacier	pre1960	evidence	best	troposphere	kilimanjaro	underestimat
#15	#25	#35	#45	#55	#65	#75	#85	#95	#105
extreme	pollutant	correlat	greenland	age	weather	hotspot	neptune	jupiter	pdo
#16	#26	#36	#46	#56	#66	#76	#86	#96	#106
saturno	pluto	icecollapse	volcano	species	wpp	co2data	ocean	ebusio	arctic
#17	#27	#37	#47	#57	#67	#77	#87	#97	#107
schube	dropped	sk	arctod	microsite	residence	shot	thermo	significant	warming
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greutate	runaway	trace	overestimate	breath	iceless	nyabloc	dni	fewdegrees	1123
#23	#33	#43	#53	#63	#73	#83	#93	#103	
cycle	freedegres	lookhard	economy	breakbad	cloud	tanger	peerreview	1145	ipcc3.0
#24	#34	#44	#54	#64	#74	#84	#94	#104	
blach	futurecool	stoneata	name	loaves	linear	linear	stomocover	1150	adi
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Available at: <http://skepticalscience.com/feednum.php>

We sometimes manage to produce some “rapid debunking” like was the case in March 2024 when Martin Durkin’s sorry excuse of a movie was launched on Youtube and elsewhere. John Mason from our team sat down to watch it and took notes while doing so. He identified 25 old myths catalogued and debunked in our database, so within a day we cobbled together a blog post and published it on Saturday, March 23. It also contained the Myth Rebuttal Chart – a bingo card if you like – highlighting the myths identified. Thanks to being shared far and wide – including by Katharine Hayhoe – the blog post has been viewed more than 30K times, an order of magnitude more than our articles usually do. We just wish that we had the resources to do this more often than is possible right now!

You can read the blog post at <https://sks.to/hotmess>

# The Debunking Handbook 2020

<https://sks.to/debunk2020>



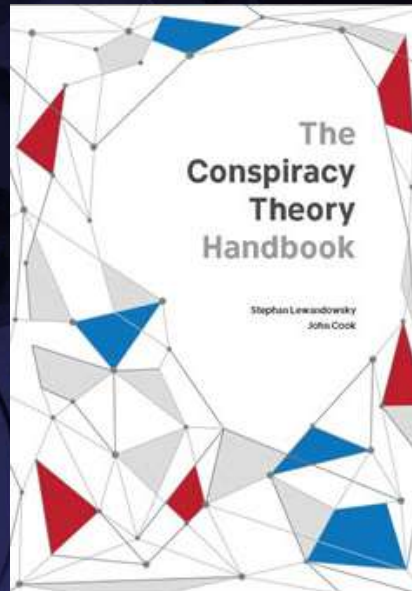
We also provide downloadable materials like various handbooks.

The Debunking Handbook is a consensus document written by 19 co-authors invited by the three lead authors Stephan Lewandowsky, John Cook and Ullrich Ecker based on their scientific status in the field. The Handbook explains what mis- and disinformation is, why it can cause substantial harm for individuals and societies, why it is often sticky and therefore hard to dislodge, why pre-bunking can be more effective than debunking and how to go about the latter best. Most importantly, it points out to not refrain from attempting to debunk or correct misinformation out of fear that doing so will backfire or increase beliefs in false information.

Download the handbook at <https://sks.to/debunk2020>

# The Conspiracy Theory Handbook

<https://sks.to/conspiracy>



Conspiracy theories attempt to explain events as the secretive plots of powerful people. While conspiracy theories are not typically supported by evidence, this doesn't stop them from blossoming. Conspiracy theories damage society in a number of ways. To help minimise these harmful effects, The Conspiracy Theory Handbook written by Stephan Lewandowsky and John Cook explains why conspiracy theories are so popular, how to identify the traits of conspiratorial thinking, and what are effective response strategies.

Download the handbook from <https://sks.to/conspiracy>

# The seven traits of conspiratorial thinking

## TRAITS OF CONSPIRATORIAL THINKING



**Contradictory**

Conspiracy theorists can simultaneously believe in ideas that are mutually contradictory. For example, believing the theory that Princess Diana was murdered but also believing that she faked her own death.<sup>29</sup> This is because the theorists' commitment to disbelieving the "official" account is so absolute, it doesn't matter if their belief system is incoherent.

**Overriding suspicion**

Conspiratorial thinking involves a nihilistic degree of skepticism towards the official account.<sup>31</sup> This extreme degree of suspicion prevents belief in anything that doesn't fit into the conspiracy theory.

**Nefarious intent**

The motivations behind any presumed conspiracy are invariably assumed to be nefarious.<sup>31</sup> Conspiracy theories never propose that the presumed conspirators have benign motivations.

**Something must be wrong**

Although conspiracy theorists may occasionally abandon specific ideas when they become untenable, those revisions don't change their overall conclusion that "something must be wrong" and the official account is based on deception.<sup>24, 30</sup>

**Persecuted victim**

Conspiracy theorists perceive and present themselves as the victim of organized persecution.<sup>29</sup> At the same time, they see themselves as brave antagonists taking on the villainous conspirators. Conspiratorial thinking involves a self-perception of simultaneously being a victim and a hero.

**Immune to evidence**

Conspiracy theories are inherently self-sealing—evidence that counters a theory is re-interpreted as originating from the conspiracy.<sup>31, 32, 33</sup> This reflects the belief that the stronger the evidence against a conspiracy (e.g., the FBI exonerating a politician from allegations of misusing a personal email server), the more the conspirators must want people to believe their version of events (e.g., the FBI was part of the conspiracy to protect that politician).

**Re-interpreting randomness**

The overriding suspicion found in conspiratorial thinking frequently results in the belief that nothing occurs by accident.<sup>34</sup> Small random events, such as intact windows in the Pentagon after the 9/11 attacks, are re-interpreted as being caused by the conspiracy (because if an airliner had hit the Pentagon, then all windows would have shattered<sup>35</sup>) and are woven into a broader, interconnected pattern.

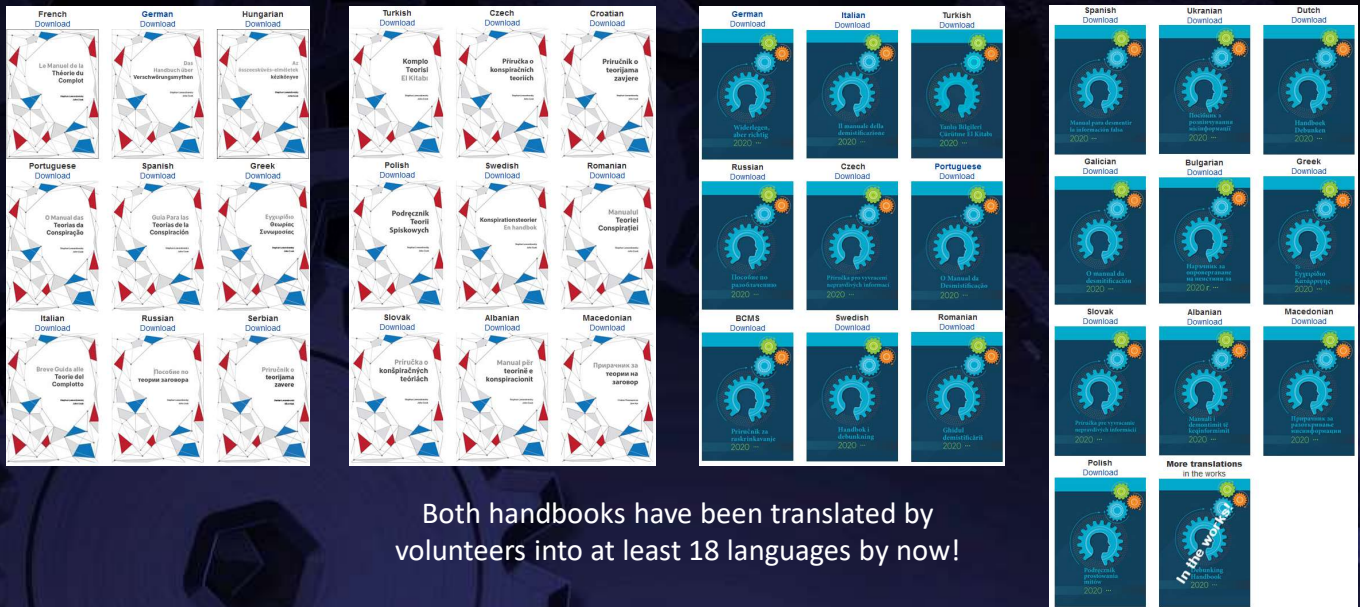
The Handbook distills the most important research findings and expert advice on dealing with conspiracy theories. It also introduces the abbreviation CONSPIR which serves as a mnemonic to more easily remember the seven traits of conspiratorial thinking:

They are contradictory, contain overriding suspicion, have nefarious intent, something must be wrong, see themselves as persecuted victims, are immune to evidence and are re-interpreting randomness.





# Translations



Both handbooks have been translated by volunteers into at least 18 languages by now!

Thanks to volunteer translation efforts around the globe, The Conspiracy Theory Handbook as well as The Debunking Handbook 2020 are available in many languages already. More translations are currently in the works.

If you are interested to help with translations, please get in touch with us via our contact form at <https://sks.to/contact> and pick “Enquiry about translations” from the drop-down list.

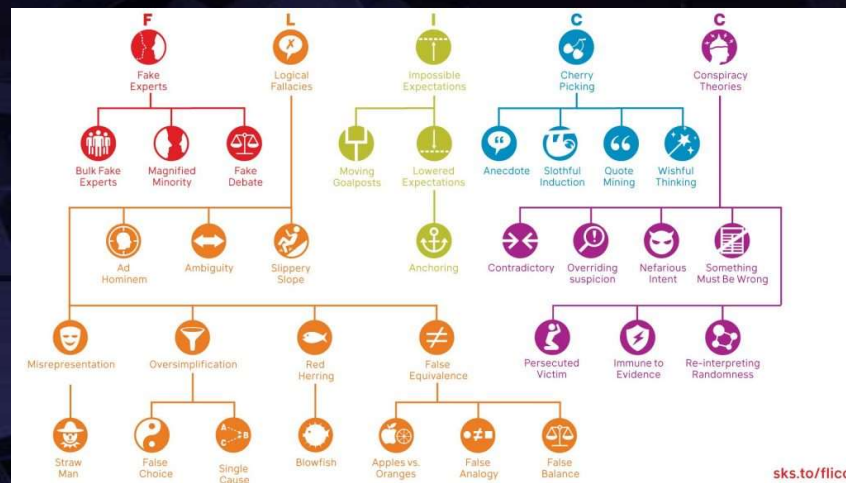
## Explain the techniques used to distort the facts



In addition to provide background information like the handbooks, we also need to help people discern the difference between fact and fiction when faced with conflicting information. We can do this by explaining the techniques used to distort the facts. This is like exposing the sleight of hand behind a magician's trick. Once people see the technique behind a misleading argument, that misinformation loses its influence.

# FLICC – the techniques of science denial

<https://sks.to/flicc-sks>

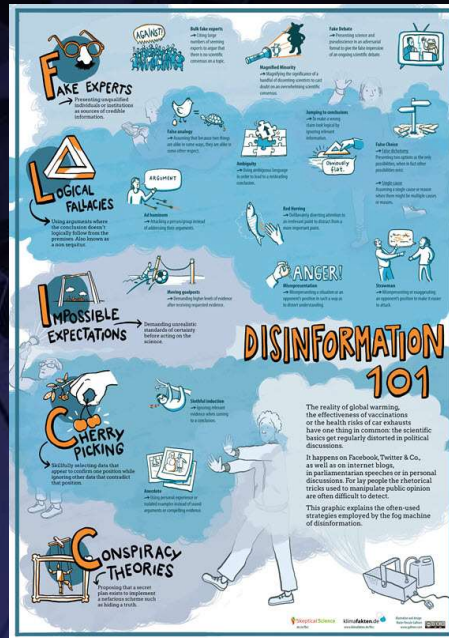


FLICC is a framework originally proposed by Mark Hoofnagle in 2007 who listed the five techniques of science denial: fake experts, logical fallacies, impossible expectations, cherry picking and conspiracy theories. These five main techniques are however just the tip of the iceberg and John Cook has gradually been building up a landscape of different techniques used to mislead.

More information: <https://sks.to/flicc-sks>

# The FLICC Poster

<https://sks.to/flicc-poster>



Many of these techniques are depicted in the FLICC Poster, which is the result of a successful collaboration between Skeptical Science and our German language partner website klimfakten.de. The poster's first version was in German but the idea to also create an English version soon came up. Several other language versions have been created since then.

Download the poster from <https://sks.to/FLICC-poster>  
Collaboration <https://sks.to/FLICC-poster-collab>.

# Cranky Uncle Game

<https://crankyuncle.com/game>



But, how to best teach people all these techniques?

John Cook's research into inoculation against misinformation led him to develop the Cranky Uncle game which builds public resilience against misinformation by explaining the techniques of science denial.

The way the game works, is that a cranky uncle basically mentors players into how to become a science denying cranky uncle by explaining all the different techniques that he uses to reject science.

Cranky Uncle goes through each denial technique and says "well here is one way that I deny science" and then he uses a lot of analogies and a lot of cartoon examples as a way of explaining those logical fallacies.

# Cranky Uncle Game

The image displays three mobile screens of the 'Name That Fallacy!' game. The first screen shows a red background with the text: "We must stop using cars or we will destroy the Earth." Below it are four fallacy options: False Choice, Cherry Picking, Impossible Expectations, and Fake Expert. The second screen shows a cartoon of a man falling from a building with the text: "YOU'LL HIT THE GROUND IN 10 SECONDS! GET BACK TO ME WHEN YOU HAVE MORE INFORMATION!" Below it are four fallacy options: Red Herring, Impossible Expectations, Single Cause, and Cherry Picking. The third screen shows a cartoon of a man and a woman with the text: "I ONCE USED AN ANECDOTE AS AN ARGUMENT AND TURNED OUT TO BE RIGHT!" Below it are four fallacy options: Red Herring, Impossible Expectations, Single Cause, and Cherry Picking. To the right, a grid of 11 national flags is shown, with a cartoon character of a man with a large nose and a blue shirt standing in front of them. The text "Translations" and the URL "https://sks.to/crankyml" are positioned above the grid. Below each mobile screen is a QR code and a URL: "sks.to/crankyiphone", "sks.to/crankyandroid", and "sks.to/crankybrowser".

Translations  
<https://sks.to/crankyml>

sks.to/crankyiphone  
sks.to/crankyandroid  
sks.to/crankybrowser

Then the game gets people practicing critical thinking. It shows them examples of misinformation and players have to try to identify which fallacy or denial technique is used in that example. The idea of the game is, that once they have learnt a denial technique, to practice that knowledge through repeated quizzes. The more they practice the more inoculated they get against misinformation.

With the help of many volunteers, the game has already been translated into 11 languages (German, Dutch, Spanish, Portuguese, French, Italian, Swedish, Turkish, Albanian, Macedonian, Finnish) and more languages (Romanian, Bulgarian, Polish) are in the works.

Find the game at:

iOS – <https://sks.to/crankyiphone>

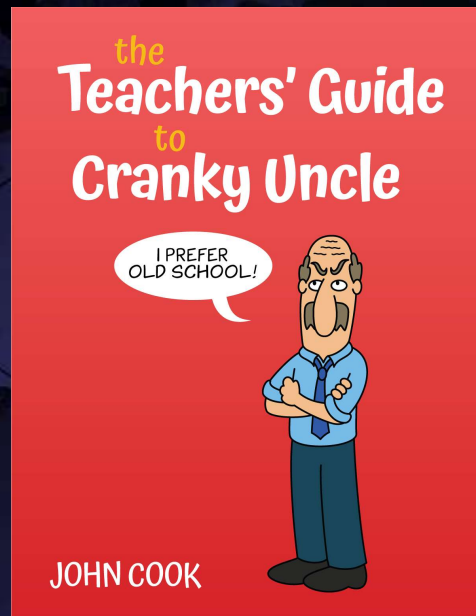
Android – <https://sks.to/crankyandroid>

Browser – <https://sks.to/crankybrowser>

More about the translations: <https://sks.to/krankym1>

# The Teachers' Guide to Cranky Uncle

<https://sks.to/crankyguide>



The Teachers' Guide to Cranky Uncle explains the science behind the game and contains resources for various class activities. It has been translated in several languages already.

Download available at <https://sks.to/crankyguide>



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## QR-Codes to some resources



Website Skeptical Science



John Cook's Cranky Uncle website



FLICC Poster



The Debunking Handbook 2020



The Conspiracy Theory Handbook



History of FLICC



Links to some of the resources mentioned

<https://skepticalscience.com>

<https://crankyuncle.com/game>

<https://sks.to/flicc-poster>

<https://sks.to/debunk2020>

<https://sks.to/conspiracy>

<https://sks.to/flicc-sks>

# Resources & References

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Lewandowsky, S., Cook, J., Ecker, U. K. H., Albarracín, D., Amazeen, M. A., Kendeou, P., Lombardi, D., Newman, E. J., Pennycook, G., Porter, E. Rand, D. G., Rapp, D. N., Reifler, J., Roozenbeek, J., Schmid, P., Seifert, C. M., Sinatra, G. M., Swire-Thompson, B., van der Linden, S., Vraga, E. K., Wood, T. J., Zaragoza, M. S. (2020). The Debunking Handbook 2020. Available at <https://sks.to/db2020>. DOI:10.17910/b7.1182

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Lewandowsky, S., Cook, J., Ecker, U. K. H., Albarracín, D., Amazeen, M. A., Kendeou, P., Lombardi, D., Newman, E. J., Pennycook, G., Porter, E. Rand, D. G., Rapp, D. N., Reifler, J., Roozenbeek, J., Schmid, P., Seifert, C. M., Sinatra, G. M., Swire-Thompson, B., van der Linden, S., Vraga, E. K., Wood, T. J., Zaragoza, M. S. (2020). The Debunking Handbook 2020. Available at <https://sks.to/db2020>. DOI:10.17910/b7.1182

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<https://doi.org/10.4337/9781789900408.00014>

Cook, J. (2021). Cranky Uncle: a game building resilience against climate misinformation. Plus Lucis, 3(2021), 13-16 – <https://sks.to/crankyintro>

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